The Excavating Engineer

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Storm Sewer Construction with a Dragline Excavator

Description of excavation of a large storm sewer in Detroit with a dragline excavator. Method of handling forms.

BRANDON & HANNA of Detroit are at present engaged in the construction of a storm and sanitary water sewer in this city in connection with which they are using with considerable success a dragline excavator.

This work is in conjunction with a system of main trunk sewers designed to take care of all storm water and sanitary sewerage, in the northeast section of the City of Detroit. The work is under the direction of Mr. Clarence W. Hubbell, Engineer for the city. Mr. Roy Ackley is Engineer in charge of the job.

Brandon & Hanna have section No. 2 of this work along Six Mile Road between Mt. Elliott and Conant Avenues. This contract calls for the construction of 7,000 ft. of concrete sewer with an inside diameter of 10 ft. 6 in.

Method of Excavation

Work was started on May 1st 1920. The trench is being excavated by a Class-14 Bucyrus dragline with a 60 ft. boom and a 2-yd. bucket, mounted on skids and rollers. The excavation is being made on an average of 40 ft. wide on top and 30 ft. deep. The slope carried at the time this article was written is ½ to one, the material standing up fairly well. The contractors however expect soon to increase this slope due to sand conditions that will develop ahead.

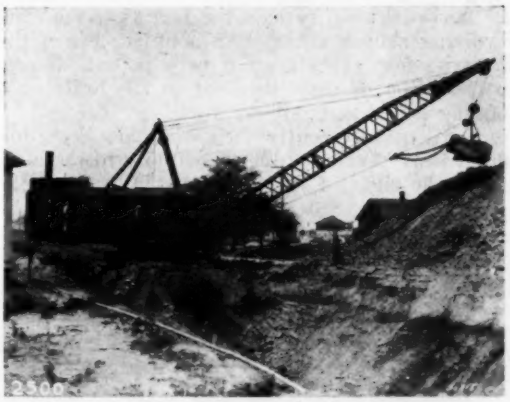
Only Three Men to Trim Bottom for Forms

The trench is trimmed close to the section required for the forms by the dragline, only three men being required to shape the bottom, and three men to operate the dragline.

The material is cast to one side, leaving a berm of about 12 ft., as shown in the views.

Progress Attained

The dragline has been actually operating but 4½ hours of the 9-hour day, the delay being due to the lack of materials. Twenty-five feet of concrete sewer is being laid per day under these conditions. The dragline has never failed to keep well ahead of the forms, the task being to keep the forms up to the dragline. According to Brandon & Hanna 50 to 60 ft. could easily be laid in 9 hours if materials were available. No delays have been experienced on the dragline.



The Class-14 Bucyrus dragline which is taking out the dirt

Construction of Sewer

Blaw-Knox telescopic steel forms are being used for the construction of the concrete sewer. The inverted third is pulled ahead and set by the dragline and the arch consisting of the remaining two thirds is carried ahead on travellers and set by ratchet jacks. This is clearly shown in one of our photographs. The concrete is delivered through a chute from a 21-S Knickerbocker Steam Mixer. The mixer is served by twenty ½-yard Lakewood Steel V-shaped cars, with a 24" gauge. They are handled by a Plymouth gasoline locomotive, the haul at present being 2,000 ft. Thirty-five men are being used on the concrete work, including the forms and other work.

Backfilling

The backfilling is being done with a one-yard clam-shell machine. In order to keep up with the dragline and make work safe, only about half of the spoil is being cast back by this machine, as

is clearly shown in the top view. The final cleaning will be made with the dragline.

The Men on the Job

Edward Gray is Superintendent in charge of the work. Glen Brandon is chief operator and A. Smith, Assistant Operator. Dock Garret is doing the firing.

The contractors expect to finish the job in the fall of 1921 but with an open winter they hope to advance this date to the late spring of 1921.

The Adaptability of the Dragline

As to the adaptability of the dragline for this work, Brandon & Hanna state as follows: "We take great pleasure in recommending the Class 14 dragline for this particular work which we now have under construction."

The Revolving Shovel Cuts Costs of Logging Road Construction

New method of operation practically cuts in half former costs. How a ⅞-yard revolving shovel operated for 10c per cubic yard for the Doty Lumber and Shingle Co.

A CASUAL survey of the operations of the large logging companies of the Pacific Northwest, reveals the fact that the small revolving shovel, caterpillar-mounted, has within the past few years been a very potent element, in reduction of costs incident to the building of logging roads and related work.

Until quite recently such work has been done under heavy expense, due principally to the clearing of the right of way through the heavy timber through which such roads are ordinarily built. This part of the work was considerably more expensive and more difficult than the actual grading that followed.

With the advent of the caterpillar mounted revolving shovel, these conditions have completely changed. The clearing of the right of way and the removal of stumps under this method of operation, is the work almost exclusively of the shovel. The revolving shovel, thus, at the out-set, on an

18-B Bucyrus Revolving Shovel Mounted on Caterpillars, Making a Thorough Cut in Connection with the Construction of the Logging Road for the Doty Lumber & Shingle Co., Doty, Washington

average proposition, eliminates the use of two logging donkeys and five or six men who were used to handle the rigging and to do similar work.

With the revolving shovel, the larger stumps are still split by the use of powder. This element of the construction costs, consequently must remain the same. It has been found, however, that the revolving shovel has literally cut in half the cost of logging road construction.

Experience of Doty Lumber & Shingle Co.

In August 1919, the Doty Lumber & Shingle Co. of Doty, Wash. purchased for the above mentioned purpose, an 18-B Bucyrus revolving shovel, mounted on caterpillar traction. The results were excellent. Continuous operation was found to be unneccessary, owing to the good performance of the machine.

According to Mr. R. W. Mersereau, Manager of the Doty Lumber & Shingle Co. costs were kept on the operation of this machine when engaged on railroad construction work. The work covered a distance of from 1400 ft. with an average cut of 5 ft. The total yardage moved being approximately 5,200 yards. To quote Mr. Mersereau—"On this job we used six men, consisting of engineer and fireman, two pitmen and two men carrying fuel, extending water pipe line, etc. The total cost of labor was $570 or an approximate cost of 10c per yard. We do not mean to say that this was an average show, but as an example of what can be done under favorable conditions.

Another View of the Doty Shovel in Operation

We frequently are so located that we can operate with four men, instead of six."

When the shovel first started work, its operation was under the direction of Mr. James Britt, formerly with the Corbin Coal & Coke Co. of Spokane, Washington and Corbin, B. C. Later on, however, its operation was under the supervision of Charles Laughlin, superintendent.

The popularity of the revolving shovel in the logging countries of the Pacific Northwest has grown with great rapidity and at the present time there are approximately 12 revolving shovels engaged in this type of work. It has finally come to be an established fact that the revolving shovel has definitely established itself in a new field.

Fording the Yakima

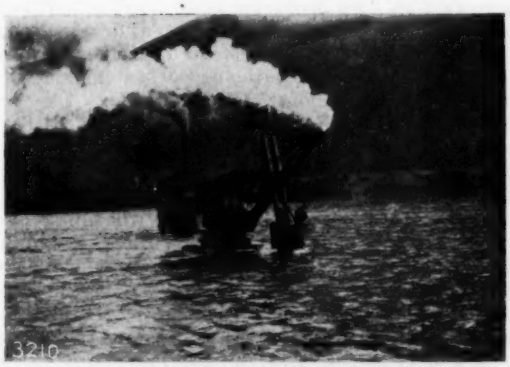
How Boss & Hampshire Took Two Revolving Shovels Across the Yakima River, Washington, Under Their Own Power

IT is not very often that we hear of a steam shovel wading across a good sized river, unassisted. This, however, is what actually happened this past winter in the state of Washington.

Boss & Hampshire, Washington, contractors, known also in Oregon as John Hampshire & Company, were awarded a contract for part of the Inland Empire Highway early in the winter. Their contract consisted of six miles along the Yakima River between Ellensburg and Yakima, the excavation running about 30,000 cu. yds. to the mile. The material for the most part was loose volcanic rock and solid lava formation.

To handle this work, the contractors used two 18-B ⅞-yard Bucyrus revolving shovels mounted on caterpillars. The shovels were shipped by rail to the nearest point on the Northern Pacific to the job, a flag station named Indio.

Here they were confronted with a problem—the Yakima River at this point 300 feet wide, lay between them and their job. No bridge was handy.



18-B Bucyrus crossing the Yakima River. The river is here 300 feet wide and 4 feet deep at deepest point. Crossing made in about 15 minutes.

There was but one thing to do, ford it.

It was found that the river at this point was four feet deep at the deepest point, the bottom consisting of round boulders of all sizes.

The first shovel crossed on November twentieth and the second on December nineteenth.

In both cases, the crossing was made successfully in from 10 to 20 minutes, in spite of the fact that the second shovel crossed during cold weather, when considerable ice was running.

Bucking loose volcanic rock and solid lava formation on the Inland Empire Highway. Excavation ran 30,000 yards to the mile. Two 18-B Bucyrus caterpillar shovels did the digging.

Solid Lava Formation on the Inland Empire Highway along the Yakima River, Washington

The bottom was very rough. It was necessary for the shovels to remove extra large boulders and in some places to fill in holes. This feat could not have been done with any other type of mounting other than caterpillar traction.

The work was under the direction of M. S. Boss and B. W. Yateman, the latter being superintendent in charge.

Transporting a Large Dragline by Barge on the Mississippi

Illustrating the Versatility of the Large Dragline Excavator—How the 4th District Mississippi River Commission Handled a 200-ton Dragline During the 1916 Flood Period

THE story of how the 4th District Mississippi River Commission fought and conquered the Floods of 1916 is now ancient history, and the exploits of the men and machines connected therewith are written in the records of the U. S. Engineer Corps. They mark a new era in the fighting of the Mississippi. In the Excavating Engineer for June 1916, an article was published, describing how by quick work the engineers took two McMyler clam shell excavators, a Class 180 Bucyrus dragline and a smaller rented dragline, on barges up the river and repaired a bad break in the levee system at Buck Ridge Crevasse, Point Pleasant, La. The big Bucyrus machine was subsequently mounted on a barge and equipped with a 3½ yd. clamshell bucket to build the box levee, further illustrating the versatility of the large dragline for work of this nature. The work was under the immediate supervision of Mr. Wm. T. Newton, Superintendent of machines. During this strenuous period Mr. Newton was, to quote his own expression "in the trenches" from Jan. 1 to Sept. 30, 1910. Upon his return to headquarters, he collected information concerning a few of the more interesting episodes of this campaign, for the Excavating Engineer, but a real war "spilt the beans" and Mr. Newton was called into active service of an even more strenuous nature. The following photographic account, sent us by this gentleman, of the moving of the big dragline to another job may be a little out of date, but it is of sufficient interest to warrant its publication as a matter of history and as an excellent illustration of what can be done with these big machines by those who know how to handle them.

Fig. 1. Rushing the dragline 300 miles up river from Ben Hur to Cowpen Neck against a raging river. Note the three tow boats in action.

Fig. 2. Dragline at Point Pleasant, La., starting to dig a 400 ft. incline at 12% grade to river, 48 ft. below. A level stretch was made each 100 ft. 35,000 yds. of material were excavated. Width of pit 60 ft. All excavation done from top of hill on original ground level.

As stated before the campaign against the flood at Point Pleasant started early in 1916 and continued through September of that year. In January, the Class 180 Bucyrus dragline, known as the U. S. Beauregard was at work on dry land at Ben Hur, La., when the levee line at Myrtle Grove, La. gave way. This latter point was about 110 miles below Ben Hur. The machine was at once loaded on a steel barge, equipped with an orange peel bucket, sent to the scene of action and attacked the break from the river side, afloat. It succeeded in closing the break.

In the meantime the flood waters continued rising and a distress call came from Cowpen Neck Dyke, 10 miles above Natchez, Miss., and more than 300 miles from the point where the machine was working. To use the expression of old river men there was "Hell a Poppin" all the way from Memphis to the sea. All efforts to hold this dyke failed and as a last resort, the Beauregard was sent upstream against 300 miles of raging river, to tackle, what the engineers considered, a hopeless task. Figure No. 1 shows the urgency of the case. Four powerful tow boats shoved the dragline, quarter boat and fuel barge up stream. The machine made good by using a 3½ yard clam shell bucket, unloading dry material from the barges and placing the same in the dyke.

In less than three months, the machine had proved its ability to use successfully, dragline, orange peel and clam shell buckets, to work ashore or afloat, and to meet conditions heretofore considered impossible.

Hardly had the Cowpen Neck Dyke work been completed, when the Buck Ridge Levee at Pt. Pleasant gave way at a point 80 miles farther up stream. As stated earlier in this article, this machine was rushed to this point and in a six mile tracking race with the three lighter machines, through recently flooded cotton, corn and oat fields, the big fellow made good in 7 days, and

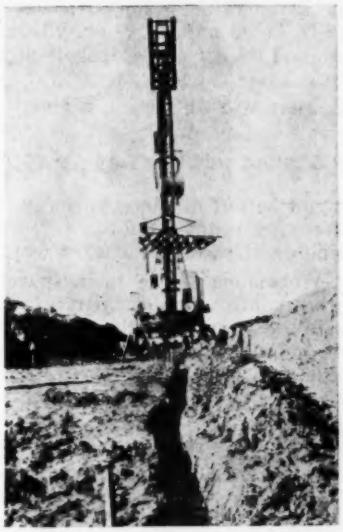


Fig. 3. Incline completed. Machine starting down to river, placing first 15 ft. section. Track laid and trip made in 3½ hours. The dark line shown is a drainage ditch to take care of subterranean springs encountered at a depth of 15 ft.

Fig. 4. About 1/3 of the way down. "The Father of Waters" coming into view. River at this point 75 ft. deep, 20 ft. from bank line. Banks of river cave badly. Land on which machine is working is a buck shot ridge, 50 ft. wide.

by putting up 25,000 yards (net) of buckshot mud in 6 days, succeeded in holding back the flood.

At the close of this period, this machine again was taken on a barge and transported down the Mississippi, 300 miles to Upper Arlington, where it was put to work on the Shannon Levee.

The accompanying photographs illustrate better than can be done by words, how these interesting trips were made. This machine, the U. S. Beauregard, was built by the Bucyrus Company for the Mississippi River Commission. It was equipped with a 175 ft. boom and a 3½ cu. yd. bucket. It was so designed that it could operate a clam shell bucket of the same capacity.

Its weight in working order is about 200 tons.

Digging 5320 cu. yds. per Day for 25½ Days

It may not be out of place to quote here from an official report relative to the performance of this machine on the Point Pleasant work.

"The performance of the Beauregard and her crew for the month are so gratifying that I am pleased to invite your attention to the same. The number of cubic yards placed in embankment during the month is 108,523 cu. yds. net, the best previous month's work by any machine being 87,000 cu. yds.

This is the largest month's work ever done by any machine here. On nine days of the month, the day's work consisted of 5,000 yds. or more and on the last day of the month the unprecendented total of 6,000 yds. was reached. Mr. W. T. Newton, Supt., operating in the absence of his runner, Mr. Roberts, was assisted by runners Frank Hingle and Jos. A. Bacas."

It should be noted that 25% shrinkage was allowed for in this work. That is to say 1¼ yds. had to be dug to get pay for one yard. The above figures are net. The actual gross yardage put up by this machine in 25½ working days was 135,653 cu. yds. or about 5320 cubic yards per day, working three shifts. We are indebted to Mr. Wm. T. Newton for the above information.

It is Not Always Easy

To Apologize.
To begin over.
To take advice.
To admit error.
To be unselfish.
To be charitable.
To face a sneer.
To be considerate.
To avoid mistakes.
To endure success.
To keep on trying.
To recognize the silver lining.
But it always pays.

—Baltimore Trolley Topics.

Fig. 5. Machine loaded on steel barge. The side walls of cut give good idea of the excavation necessary and the drop. Any miscue would have meant a plunge in the river.

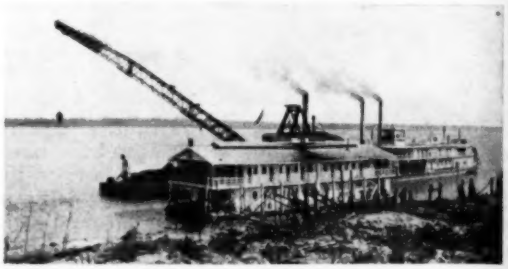


Fig. 6. Ready to sail to upper Arlington 300 miles away. House boat next to bank is for accommodation of the machine crews. Living quarters are excellent. Hot and cold water, baths and best of food. Barge for fuel on other side of barge carrying dragline. Note orange peel bucket on fuel barge used when machine is operated from the barge.

Fig. 7. Arrival at Shannon Levee job Upper Arlington. Showing incline prepared and machine ready to move off barge. Incline dug by dragline from barge, Grade 12% with a 14° curve, 250 ft. long. Dragline went to top in three minutes. No stops.

The New Jersey Slag Products Plant, Wharton, New Jersey

Brief Description of Slag Plant Now Operated by the Duquesne Slag Products Co. of Pittsburgh. Performance of Caterpillar-Mounted Revolving Shovel in Frozen Ore.

THE New Jersey Slag Products Co., an incorporated concern, organized for the purpose of digging and crushing for commercial purposes, the slag from the steel mills of the Wharton Steel Co. of Wharton, N. J., leased that company's slag bank, containing hundreds of thousands of tons of slag, the purpose being to crush the slag into several different sizes and market it for roofing concrete, sub-base and base for highways and for the top course in highway construction.

The plant consisted of one 70-C Bucyrus steam shovel, American standard-gauge locomotives and 8-yard Western cars. They also operated two Ohio locomotive cranes of 25-ton capacity. The crushing plant consisted of one McCulley, No. 8 giratory crusher and an auxiliary set of Buchanan rolls. The material was elevated to the bank by a Link Belt conveyor with 8-foot centers, where the material was screened and sorted. The 70-C shovel loaded the slag, without blasting, into the 8-yard cars, which were then hauled to the hopper. The capacity of the plant was about 200,000 tons per year. This plant is now being operated and the products disposed of by the Duquesne Slag Products Company of Pittsburgh, Pa., one of the largest operators in the country.

Ore Recovery

In the same year the above Company took over the ore unloading contract from the Wharton Steel Co. and constructed an ore yard, consisting of from 70-foot trestles, 750 ft. long, with a capacity of 500,000 tons of ore. The ore yard is a mile and a half from the furnace. This material was re-claimed with an 18-B Bucyrus revolving shovel, mounted on caterpillar traction and loaded into 50-ton cars for transporting to the furnace.

Revolving Shovel Operation

The operation of this small shovel during the severe winter months of 1917 provides an interesting illustration of the value of a shovel mounted on caterpillar traction, where a considerable amount of moving about is necessary.

The ore was badly frozen and while the Company did not consider it absolutely necessary to drill and shoot the material, this was, however, done in extreme cases, in order to relieve the shovel and to assist in giving the necessary tonnage to keep the furnaces in operation.

Value of Caterpillar Traction

The shovel handled from 1,000 to 3,000 tons per day in two 8-hour shifts. The ore, which was

18-B Bucyrus Shovel Mounted on Caterpillars, Loading Frozen Iron Ore for the New Jersey Slag Products Co., Wharton, N. J.

from several different mines, was deposited in separate stock piles. In order to give the furnaces the proper mixture, it was necessary for the shovel to move from one stock-pile to another several times during the course of a day's operation. This was made possible with the caterpillar equipment. Moving was done with ease, despite the fact that at times it was necessary to move through from one to two feet of frozen ore.

The shovel excavated about 390,000 tons of frozen iron ore during four months in the winter of 1917, and moved an average of about 1,000 feet per day from stock-pile to stock-pile.

The 18-B was purchased in October 1917 and also first employed during the early winter on railroad excavation, the material being hardpan, frozen to the depth of about 18 inches. The cut was approximately 8 ft. deep. This also was handled without blasting.

On January 1, 1918, the shovel was moved to the ore yard where it was employed in excavating iron ore as above stated. The ore was frozen to a depth of 6 to 8 feet in some places. Those connected with the operation of the shovel, have stated that they were not delayed by break-downs during this period, and the operating cost was exceedingly low.

Another View of New Jersey Slag Products Co.'s 18-B Bucyrus Shove Loading Iron Ore

Railroads Sawing Wood While the Talkers Talk

It is in a sense unfortunate for the railroads that this is a presidential year. In the fireworks and heat of the campaign political news naturally holds the center of the stage and the public all but forgets there are such conveniences in the land as railroads. If it were not for the great amount of campaign news, the papers right now would be full of accounts of the great strides the railroads are making in clearing up the freight congestion. While the campaign goes noisily on, the railroads are quietly furnishing a brand of transportation that would have been considered impossible a few months ago.

At any rate, this is the opinion of L. H. Bean, Vice-President of Dwight P. Robinson & Company (with which Westinghouse, Church, Kerr & Co. is consolidated), engineers and constructors who do business with fifty or more different railroads.

"People generally do not appreciate what an improvement the railroads have been making in their service," says Mr. Bean, "in spite of an estimated shortage of 324,000 freight cars—as a result of the war. Added to the car shortage is the great number of cars in bad condition. So serious has this shortage become that farmers have been warned that they might not be able to get their grain harvest to market.

"In the industrial field plants have had to limit their production even with their sidings filled with cars—some in such bad order as to be useless. Some private companies have even repaired cars on their sidings at their own expense rather than delay their shipments further. Others have placed orders with car builders for their own rolling stock. This serious situation has been steadily improved. The Interstate Commerce Commission has authorized increased demurrage and reconsignment charges, to cut down non-productive time of cars; the Association of Railway Executives has sent for its goal an average movement of not less than 30 miles a day for each freight car, and a reduction of the number of "bad order" cars not to exceed 4% of the total owned. As a result, the railroads report moving 4000 carloads more than in August 1918, which was the record up to that time."

Up to Motive Power

"But new freight cars or repaired freight cars alone cannot speed up the movement of traffic to the desired point. In the last analysis this can only be done by increasing the number of locomotives available for service. Locomotives, not cars, are the neck of the traffic bottle.

"Not only are the railroads short of engines, but too many of those they have are out of repair too much of the time. The percentage of out-of-order locomotives sometimes runs as high as 25% of those in operation. As a modern locomotive is worth upwards of $75,000, the loss to the railroad and to the public is considerable whenever an engine is idle. Engines get out of repair so frequently and remain out so long because of the general lack of modern locomotive terminals and repair shops.

"Railroads have only one commodity to sell—transportation. And with a large percentage of locomotives out of repair transportation cannot be delivered, regardless of the condition and supply of cars or the efficiency of management in other respects.

(Continued on page 316)

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The Revolving Shovel and the Logging Industry

The logging industry is the latest field invaded by the small revolving shovel. This fact lends particular interest to the article which we publish in this issue on the operations of the Doty Lumber & Shingle Co., of Doty, Wash. This is the second article on small revolving shovel operation for the construction of logging railroads that we have published in the last few issues of this paper.

The problem that confronts the logging industry at the present time is affected very generally by the existing problems of high cost of labor and materials, but this industry is now confronted by a particular problem of its own.

The depletion of the more accessible stands of timber, which has been becoming more evident year by year, is forcing this industry into more and more remote regions. This has brought to the fore the importance of the development of proper methods of transportation. A much larger percentage of the logged timber than in the past, must now be hauled by railroads or over roads in order to reach the markets. Within the last year or so, logging companies have been devoting considerable time to the solution of the problem of the most economical method of grading these roads. The experience gained by these companies has proved that the small revolving shovel mounted on caterpillars is an indispensable tool for this purpose. This type of machine possesses not only sufficient power for the purpose, but the successful development of caterpillar traction has solved for all practical purposes, the troublesome transportation problem, as far as the machine itself is concerned. The economy of caterpillar traction has been so conclusively shown that the demand for this type machine is growing with rapid strides.

We have mentioned the advantage of the caterpillar shovel as far as transportation is concerned, but we would not be doing justice to the subject if we did not say something in reference to the labor situation. The scarcity and comparative inefficiency, as well as the high cost of labor is so serious a problem these days and the prospect for relief is so indefinite, that the labor-saving feature of the caterpillar shovel makes a very strong appeal. It is simple to see how the reduction of pit and track labor may be affected by a steam shovel thus mounted.

The shovels most generally used for this purpose are of two sizes, the 1-yard and the 2/3-yard machines. The larger shovel has proven to be a little more desirable in the great majority of cases, because of its added strength, its ruggedness and its ability to handle more difficult excavating problems, whereas the smaller shovel has frequently found its field in inaccessible regions, where a small saving in weight is an important consideration.

Aim to Hit, or Don't Shoot

You may not have heard of the cautious hunter who went forth to hunt deer, and when the deer appeared, aimed to hit it if it was a deer or miss it if it should happen to be a calf.

It is a foregone conclusion that whether it was a deer or a calf, it escaped with an unpunctured hide, and our hunter had one cartridge less in his belt.

Many of us, however, have become acquainted at one time or another with the citizen who hoped to make good on the job which he obligingly took, with the aim to work if he wanted to, or to loaf if the loafing was good. If we were observant we might have noticed that this citizen ended up in one of a few ways: He either ended by getting fired, by getting someone else fired or by firing the sparks of dissension on the job, which resulted in the end in loss to the contractor, loss to the men and delay, inconvenience and higher prices for the public.

From the point of view of the welfare of mankind such a citizen deserves nothing and by all that is honest and square, should get nothing. If his boss is a bum, or if his job is one that doesn't suit him, he can exercise his American privilege and quit, something he can't do in Russia.

But right here is the point. If our cautious hunter had made sure first whether it was or was not a deer, and then fired to hit or fired not at all, what would have been the result?

In the first case, if he were a good hunter, he would have "come home with the bacon," in the second, he would have saved ammunition. Then apply this to the man out for a job, whether it be as an operator on a steam shovel, as a president of a corporation, as a clerk in a dry goods store or as a pitman: Hit that job hard or don't take it at all. Aim to hit or don't shoot.

· FIELD NOTES ·

Care of Hoisting Ropes on Excavating Machinery

This is the third installment of the series of articles on the above mentioned subject. The following articles appeared in the previous issues noted and may be obtained by sending for the back copies necessary. Lubrication, September issue, Installation, October issue.

Attachments of Rope Sockets.

The rope may be attached to its load by means of a socket, or it may be bent back on itself to form an eye and the loose end clamped to the rope with rope clips or clamps. Properly done, the former method of attachment develops the full strength of the rope, but it has several disadvantages.

Poor workmanship is concealed, showing only when the rope slips or breaks in the socket; it can not be readily inspected; the rope is rigidly held in the socket and the effect of bending is concentrated just above the socket; and it is much more difficult to make.

The latter method, fastening by clips, develops, at most, only about 85% of the strength of the rope, usually not more than 80%. It bruises and crushes the rope where the clips are applied, and is liable to slip; but it can at all times be readily inspected and requires little skill in making. Rope makers, however, recommend the socket method of fastening, and if properly made it never fails. After either a socket or clamp attachment is made, it must always be tested by making several trips under a heavy load.

The method of making the best socket joint is as follows: The rope should be securely seized or bound at the end with soft iron wire before the end of the rope is cut square. An additional seizing should be placed on the rope, a distance equal to the length of the socket from the end. After the rope is trimmed off, the seizing on the end of the rope should be taken off, the rope opened down to the second seizing, the hemp center cut out and the wires broomed out. That is, they should all be untwisted but not straightened. Then the wires should be thoroughly cleaned in benzine, naptha, or gasoline, as far as they are to be inserted in the socket, and then dipped in commercial muriatic acid for 30 to 60 seconds until the acid has cleaned each wire. Next, the rope end should be dipped in boiling water, to which a small amount of soda has been added to clean off and neutralize the acid. Then the rope end is inserted in the socket and warmed if the temperature is below 65° F., to prevent cooling the zinc too rapidly. The socket is placed with its axis vertical and coinciding with the axis of the rope, the bottom is sealed with clay or putty, and molten zinc or spelter, heated to a temperature that will just char wood, is poured into the socket until it is full. Lead or Babbitt cannot be used in this method because they will not solder the wires to the filling material as zinc will. Use only a good grade of zinc. Such a rope socket, attached carefully with good material will hold and give nearly 100% efficiency of the rope strength.

Should it be impossible to obtain good zinc to make a socket fastening as described above, then the older method usually called "loading of sockets," is more reliable. In this case the wires of the rope are cleaned at the end as described above with the material on hand. Then the socket is pulled over the rope and every wire is bent back by means of pliers for 1 to 1½" length. Next the rope is pulled back into the socket and molten lead or babbit poured into the sockets. With this method we have no soldering effect between the wire and the filling metal and the wires are holding depending on the hook formed at their end. Naturally the wires will be distorted, subject to uneven tension at the end of the socket, reducing the efficiency of the joint.

(For method of attaching wire rope clips and number required, see Excavating Engineer June 1920, P. 123.)

Pipe Fittings

A common occurence of broken pipe threads is often met with in fittings; to remove the few threads left depends mostly on the accessibility of the pipe. A cut is made on the inside of the broken piece with a small sharp-edged file or a tool made with a piece of saw blade and two strips of wood held by wrapped tape. Hammer slightly around the fitting and with a cape chisel, hammer one side in and the piece will come out easily. After taking out a broken piece it is advisable to run the tape in, or a nipple, to smooth any roughness and clean the threads before screwing in the new piece of pipe.—*Cement and Engineering News.*

Be a Booster

If you see some feller tryin'
For to make some project go
You can boost it up a trifle;
That's your cue to let him know
That you're not a-goin' to knock it
Just because it ain't your "shout,"
But you're going to boost a little,
'Cause he's got the "best thing out."

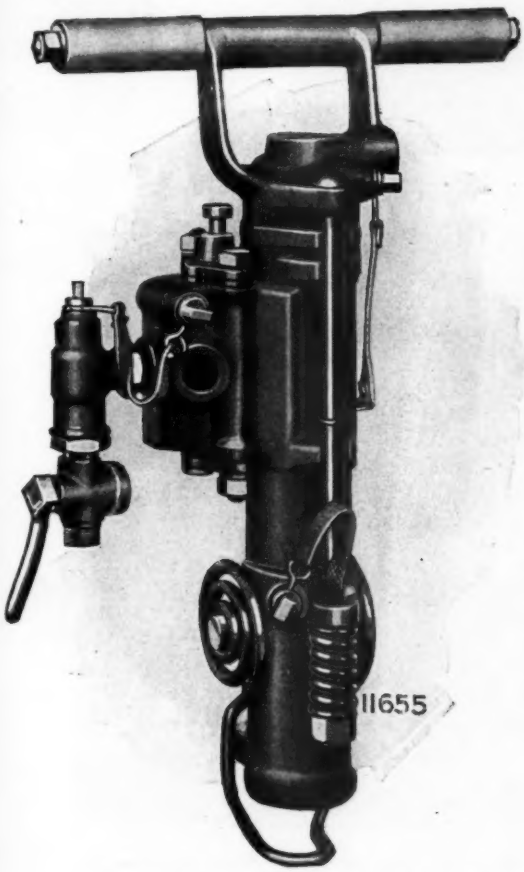
If you know some feller's failin's,
Just forget 'em; 'cause you know
That same feller's got some good points,
Them's the ones you want to show;
"Cast your loaves out on the waters,
They'll come back," 's a sayin' true;
Mebbe they will come back "buttered,"
When some feller boosts for you.

—*Exchange*

DEVICES YOU OUGHT · TO KNOW ABOUT ·

Another New "Jackhamer"

Another "Jackhamer" has just been brought out by the Ingersoll-Rand Company, 11 Broadway, New York. It is known as the "DCR-13." This completes the "Family of Jackhamers" manufactured by this Company. The others are—the "BAR-33," 21 lbs. the "BBR-13", 36 lbs., the "BCR-430," 41 lbs. and the "DDR-13," 70 lbs.; altogether there are five sizes and thirteen (13) types. This Company now claims to have a "Jackhamer" available for every hand hammer rock drilling job.



The new "Jackhammer" weighs 55 pounds. It is rated to drill holes up to twelve (12) feet deep rapidly in hard rock and it will fill all the requirements of a medium weight "sinker" or down hole drill. Hence it will be welcomed for shaft sinking, quarrying, road-building, prospecting, developing, etc.

The "DCR-13" is extremely simple and sturdy, so it will easily withstand the most severe uses encountered in the class of work for which it is designed. The features most worthy of note, are:—

All Steel Construction—Steel Drop Forgings or bar stock being used exclusively and specially heat treated.

All Bolted Construction—nothing to work loose and easy of access.

Automatic Rotation— very powerful, relieving the operator of this fatiguing part of the work.

Spring Retained Front-Head—takes up shocks that would otherwise fall on the machine.

"Spool Butterfly" Valve—operating on the well known "Butterfly" principle.

"Handy" Hole Blowing Device—very effective in keeping the drill hole clear.

Renewable Bushing in Rotation Sleeve.

Automatic "Heartbeat" Oiler and grease pockets in handle and fronthead assure continuous satisfactory lubrication.

These drills are furnished for drilling dry holes (DCR-13) and wet holes (DCR W-13). Although they are usually used unmounted as sinkers, they may also be supplied with the "JC-11" mounting for development or light drifting work.

Full information about this new Jackhamer can be obtained by writing to the Ingersoll-Rand Co., 11 Broadway, New York City, using for convenience the postal card inclosed in this issue.

World's Largest Mixers Fall 60 Feet

Back in Service After Minor Repairs

Recently, a fire at Wilson Dam, part of the Muscle Shoals project under Government construction, destroyed the trestle work at the cement shed. Two gigantic Smith Tilting Mixers, the largest in the world, capacity four cubic yards, fell approximately sixty feet from their mounting on this trestle work.

At first is was thought it would be necessary to replace the mixers with new ones entirely, but after careful examination it was found that proper repairs would easily return them to good working order. In spite of the terrific heat to which these machines were subjected in addition to a fall of sixty feet, practically no castings were broken. All the gears except the bevel gears survived the shock perfectly. Just three teeth in the main gear ring were smashed.

This is remarkable evidence of the exceptional endurance of these mixers. The Government will soon have them pouring concrete again.

These mixers have both been in Government service for several years. They are two of the only

One of two 103-C Bucyrus steam shovels recently installed by Pickands, Mather & Co. for loading iron ore in the Plymouth Mining Co. at Verona, Mich.

18-B Bucyrus revolving
nation of grade cross
Minneapolis. Gen.
subcontract for th

Digging down a 22% grade. The portly gentleman in the foreground is Mr. Tripler, ringmaster and owner of a flock of Mack trucks. Note that the 14-B is waiting. The gentleman in the background with a straw hat is James Fallon, aid to Thomas Crimmins and the man responsible for the yards going out and the dollars coming in. We could not get him to look our way. He is not the homeliest man in New York, either.

The two above photographs illustrate a job completed on Sept. 3rd, by the Thomas Crimmins Contracting Co. of New York for the Fisk Rubber Tire Co. on the south side of 57th St., New York City, from Broadway to being 18 to 20 ft. long. All of this material was handled with ease by

...ounted, at work on elimi-...ern Pacific R. R. in East ...ction Company has the ...ston Bros. Company.

It is not a usual sight to find a revolving shovel in the streets of Chicago engaged in the work of wrecking old buildings, but this is just what this machine is shown doing. The shovel is an 18-B owned by W. J. Newman Co. It is here illustrated wrecking a building just north of the Board of Trade. This might serve as a valuable suggestion to other contractors for the use of their shovels.

Two gobs and a 14-B make a happy combination. Nothing stops them. They are ripping out brick walls and concrete footings.

...York. ...vation involved the removal of about 15,000 cu. yards for a $2,000,000 office building, which will be erected by the Fred. T. Ley Co. ...y to ... material consisted of brick walls, stone foundations, concrete footings and piling, some of the latter ...ame by ... shovel, a 14-B Bucyrus. The shovel pulled the piling without any difficulty.

six four-yard mixers ever made. Besides these two which were made for the Government, four others of this size were made for the Hardaway Construction Company several years ago, by The T. L. Smith Company, General Sales Offices, Chicago, Ill. They are the only mixers of this size ever built.

Some idea of the gigantic size of these machines can be gained best by comparing the size of the men with the size of the drums in the pictures showing the fallen mixers.

Each mixer weighs about 48,000 pounds and has a capacity of 112 cu. ft. of mixed material, or 168 cu. ft. of loose, unmixed material. They are mounted on steel skids and each is equipped with gated batch hopper and frame, power tilting device and friction clutch pulley. The remarkable feature in their operation is that the entire mixed batch is discharged at one time by automatic tilting of the entire drum, which revolves as it discharges. It is the same principle as dumping a bucket upside down to empty it. This tilting principle as applied to mixers of this size gains enough time in discharging to enable the same sized crew to pour about 150 to 200 cubic yards more per day than any type of non-tilting mixer could possibly pour.

The Smith Mixers after the 60 foot fall

SHOTS FROM THE FIRING LINE

Arizona

Joseph H. Cunningham is firing a Bucyrus machine for the Phelps Dodge Corp. at Bisbee.

State Highway Dept. Phoenix, let the contract to M. Ryan, 935 Bway. San Diego, Cal., at $143,112 for gravel surfacing 8.6645 mi. Sect. D. Florence Superior Highway, Federal Aid Project 23, involving 46,430 cu. yd. unclassified excav. in roadway, cost $1.65 per cu. yd. 20,760 unclassified borrow excav., $1.65, 730 cu. yd. unclassified structural excav.

Arkansas

The Ottoer Bayou Drainage District, Chicot County, comprising approximately 23,000 acres adjacent to the Mississippi River, has been organized at Eudora. John T. Chambers, at Harwood, Commissioner.

Otter Drainage Dist., Chicot County, organized; C. G. Moon, M. Schwartz, John T. Chambers, Commrs.; drain 23,000 acres adjacent to Mississippi River.

California

Peterson, Dillon and Patterson of Calexico, have been awarded contract for construction of 30 miles of new highway at $750,000.

Work on the five major projects which comprise San Diego County's highway program is proceeding satisfactorily, according to a report made by R. M. Morton, county engineer, to the Board of Supervisors, recently.

The 4-mile unit of the state highway lateral between Downievielle and Goodyear Bar will be constructed at once.

The Board of Supervisors at Bakersfield, has awarded a contract for the construction of a section of highway linking up the Maripoca, Fellows and Taft highway at Taft, to Rogers Brothers of Los Angeles, at $139,650.

Canada

Winnipeg and Vicinity

The Alberta Government have let a contract to the Northern Construction Company for putting in shape the railroad line from Edmonton to Fort McMurray.

The Backus interests have obtained pulp limits near the City of Kenora, Ontario and are contemplating the construction of about two hundred and fifty miles of railway to connect them with the main roads.

The Canadian National Railways have under consideration the construction of a large reservoir near Melville where the scarcity of water has been a great handicap in the system. The proposed reservoir will necessitate the excavation of approximately six hundred thousand yards of material, and as the plans are complete it is expected that this work will be let early next season.

Owing to the scarcity of labor much of the contemplated work throughout Western Canada has been postponed until next season.

The President and Board of Directors of the Canadian National Railways, which now includes the Grand Trunk Pacific, Canadian Northern, as well as the former Government Lines are on an inspection trip over the Consolidated Systems. One of the special objects they have in view is to reach a decision on what construction work will be necessary for next year.

H. A. Dixon, formerly Chief Engineer of the Canadian Northern Railway has been appointed Chief Engineer of the Canadian National Railways, Western Lines, which now includes the Grand Trunk Pacific. His headquarters will still be in Winnipeg.

W. P. Brereton, City Engineer, Winnipeg has prepared plans for a subway under the C. P. R. tracks on Sherbrooke Street. The proposed subway will be approximately a thousand feet under ground, and the cost

of construction is estimated to be in the neighborhood of two million dollars.

A new road which will connect Amherstburg with Ojibway Ontario, will be constructed at a cost of about $100,000. Hon. F. C. Briggs, Minister of Public Works.

Vancouver Notes

Tenders addressed to R. C. Descrochers, Secretary, Department of Public Works, Ottawa, will be received until 12 o'clock noon, Thursday, December 9th, 1920, for the construction of a dryrock at Esquimalt.

A form of proposed contract between the Mexican government and the Prince Rupert Dry Dock and Shipbuilding Co. is before the Marine Dept., Ottawa, for approval. It consists of the construction of 37 vessels, tankers, coast patrol, freight and passenger boats. Norman Erb, a New York financier, is conducting the negotiations.

E. H. James, representing A. D. Swan, consulting engineer, Montreal, has been appointed resident engineer for the Ballantyne pier, Vancouver. Mr. James, who is a graduate of London University, has had many years of experience on harbor and dock construction. Before the war he was engaged on harbor and bridge foundation work in eastern Canada. He went overseas with the Canadian Engineers and saw over four years' active service in France. After being severely wounded he was transferred to the Royal Engineers, being appointed instructor in explosives. At the time of armistice was assistant bridging engineer, G. H. Q. He thereafter returned to Canada and rejoined A. D. Swan's staff. He was recently retained as an expert in dock construction in connection with the protected litigation of the public works department versus the Halifax Graving Dock Co. Mr. James is an associate member of the Institution of Civil Engineers.

It is understood that the contract for steel and concrete construction for the Ballantyne pier will be awarded by the Dominion Government to the Northern Construction Co., of Vancouver, which is reported to be the lowest of the five bids submitted. The price is said to be in the neighborhood of four and a half million dollars. There were five bids, the Northern Construction Co., of Vancouver; Sir John Jackson Co., of Victoria, Vancouver and London; Pearsons, of London and New York; the Pacific Construction Co., of Vancouver, and Grant & McDonald. The building of the pier, without the sheds, will cost approximately three million dollars. The sheds will cost over two million dollars, and the equipment itself will cost two to three hundred thousand dollars. In addition, there is the excavation and fill, now under way. Grant & McDonald have contract for this at a figure between six and seven hundred thousand dollars.

Central States Notes

BY BRUCE P. SMITH AND H. M. SWIGART, CHICAGO

The Lake Shore Land Co. of Algonquin, Ill. are operating an 85 ft. boom Monighan dragline and a Marion Model 70 shovel in their pit. Mr. Frank Smith is operating the dragline and Mr. Gus. Bernesky is operating the Model 70. Mr. J. A. McMahon and Mr. J. A. McMahon, Jr. are in charge of this work.

The A. Y. Reed Gravel Co. are operating a Vulcan Shovel in their pit at Elgin, Ill. Mr. C. J. Supernaw is operating the machine. Mr. W. E. Supernaw is Superintendent. A Thew is doing the stripping. A Class 14 Bucyrus dragline mounted on skids and rollers is being installed now to handle the stripping and gravel.

The Mud Creek Drainage Commission expect to collect their assessment of benefits in the very near future so that work may be started on their district. The commissioners are M. A. Heffner, Frank Zahm and Roy Burrus, all of Arenzville, Ill.

C. J. Gabler is operating a Marion 21 shovel for the Western Asphalt Printing Corp. at Sioux City, Ia. James Latimer is firing.

E. J. Ward is engineer and A. H. Ward is craning the Carnegie Steel Corporation's Bucyrus new 103-C shovel recently installed at McDonald, Ohio. This is a slag operation.

W. H. Brown and Joe Shipps are engineers and John Ready and Joe Shipps, Jr. are craning on the I. I. Coal Co.'s 175-B Bucyrus shovel at Danville, Ill. Chas. Schmidt is operating the 35-B Bucyrus shovel. Mr. J. A. Donaldson is Superintendent.

John Brogen, Carrollton, Ill., was awarded contract for project 12, Sec. 11A, Union County, earth road $86,085.

Pleas Construction Co., of Chicago, Ill., was awarded contract for project No. 1, section 23, Lee County, concrete, for $19.975. Hedgese Construction Co., Greenup, Ill., was awarded contract for project 2, Section L, Iroquois County, concrete, for $29,039, and project 2, section M, Iroquois County, concrete, at $19,356.

W. A. Owen of Poseyville, Ind. was awarded contract for two rock roads in Wabash Twp. for $15,684 and $16,132 respectively.

$16,000 will be expended to build the Gilmore road in Ohio Twp., Ind. and $18,700 to construct the Otee road in Jackson Twp. Ind.

State Highway Dept., Lansing, Michigan, let contract grading, draining and surfacing 7.329 mi. Assessment Dist. Rd. 137, 16 ft. wide, Ionia and Kent Counties, involving 6,325 cu. yd. earth excav., 22,392 sq. yd. base and 47,117 sq. yd. top course gravel surface, etc., to L. F. Seymour, Farwell, $40,006; grading and draining 9.651 mi. State Trunk Line Rd. 28-6, Sect. B, Gogebic Co., 57,380 cu. yd. earth and 2,688 cu. yd. rock excav., 12.9 acres clearing, 1,744 sq. rods grubbing, etc., to J. E. McNicholas, Marenisco, $84,841.

Comrs. Montmorency Co. of Atlanta, Mich. let contract grading, draining and surfacing 3.277 mi. Sect. B, State Trunk Line Rd. 32-4, to F. H. Lond, Alpena, $55,547.

Tulsa Co. of Tulsa, Okla. had plans prepared for open ditch work in Sects. 3, 4 and 5, Twp. 19, Range 12. About $60,000. Hughes Eng. Co., 310 Scott Bldg., engrs.

Office of the Secretary, Mississippi River Commission, 1311 International Life Building, St. Louis, Mo.—Sealed proposals will be received here until 11 a. m., Nov. 5, 1920, for constructing about 1,100,000 cubic yards of earthwork by the hydraulic method in the Sny Island Levee Drainage District, Ill. Further information on application.

George C. Crabbe is running a 14-B Bucyrus shovel for the E. R. Synold Co. of Joliet, Ill.

J. N. Miller is operating a type 300 Marion shovel for the Stewart Coal Co. at Clay City, Ind.

Presque Isle Co. of Michigan let contract grading, draining and surfacing 2.99 mi. of Michigan State Trunk Line Rd. 10-24, Sect. A, involving 24,300 cu. yd. earth excav., 28,656 sq. yd. gravel surface, 3,215 lin. ft. guard rail, 237 lin. ft. pipe culverts, etc., to E. McClure, Posen, $57,629.

Comrs. Kent Co. let contract grading, draining and surfacing 3.647 mi. of Michigan State Trunk Line Rd. 44—3, 16 ft. wide, involving 26,712 cu. yd. earth excav., 34,236 sq. yd. gravel surface, 483 lin. ft. pipe culverts, etc., to H. J. Taber, 214 Eastern Ave., N. E. $52,686.

Bd. Rd. Comrs. Lapeer Co. let contract grading, draining and surfacing 2.993 mi. of Michigan State Trunk Line Rd. 21—12, 16 ft. wide, involving 14,274 cu. yd. earth excav., 28,093 sq. yd. gravel surface, 604 lin. ft. tile culverts, etc., to J. Decker, Rogers, $44,062.

Ingham Co. let contract building 5.628 mi. road in Michigan 2 course Class "B" gravel, to A. Lathorp and C. E. Hodge, Dansville, Michigan, $46,359.

UMI

Clinton Co. Iowa, let contract grading and draining 17.4 mi. Lincoln Highway from Clinton to 2 mi. west of De Witt, involving 60,000 cu. yd. earth excav., etc., to Koss Constr. Co., 2818 5th St., Des Moines. About $840,000.

Pottawattamie, Co. Iowa let contract for drainage work; Sect. 1 involves 160,000 cu. yd. excav., Sect. 2, 1,000 cu. yd. excav., to E. A. Wickham & Co., 19 Scott St., $0.22 and $0.25 respectively.

Hardin Co., Iowa, let contract building D D 55, involving 268,022 cu. yd. excav., to L. C. Wood & Co., Alden, and R. J. Phelps, Davenport, Iowa.

Ray Mitchell has recently started running a Bucyrus shovel at Oswego, Ill. He states that it's a good shovel for a beginner because he can't break it up.

Harvey Bell is running a shovel for the Owen Block Coal Co. at Patricksburg, Indiana.

T. H. Wallace is running a 65-ton Bucyrus shovel for the C. M. & St. P. R. R. Co., at Mason City, Ia.

Colorado and Vicinity

BY H. N. STEINBARGER, DENVER

Prowers County, Colo., and the State Highway Commission are endeavoring to secure the approval of a road from Lamar to Granada by the U. S. Bureau of Public Roads. At the present time the road is in very poor condition and very difficult to maintain. If approved 6½ miles of this road will be graded and surfaced with sand and gravel. It is a much used thoroughfare and this improvement is greatly needed.

The Federal Government recently approved a number of projects in Colorado and Wyoming. All of the work will be done under the supervision of the engineers of the Bureau of Public Roads, the Government furnishing half the amount of money to be expended on each project. Among those already approved is the Cheyenne Wells road between Cheyenne Wells and the North County line of Cheyenne County—awarded by the Federal Government $12,428.

The DelNorte-Saguache road between these two towns in Rio Grande County awarded $15,990.

The Spanish Trail between Bayfield and Archuleta County line $23,339.

Moffat Highway, between Craig and Maydell in Moffat County $29,383.

The Rainbow Route between Saguache and Cochetopa, in Saguache County $26,775.

Pikes Peak ocean to ocean Highway between Limon and Mattison in Lincoln County $26,838.

All the above road projects are in Colorado. Those in Wyoming already approved are as follows:

Yellowstone-Glenrock Highway, in Converse County awarded $209,360.

Yellowstone Highway from Casper north, in Natrona County $134,970.

Saratoga Encampment road, Carbon County $16,000.

Torrington-Goshen Hole road $52,030.

One of the most beautiful scenic highways in the State of Colorado is the new North Creek Highway which runs through the part of the San Isabel Forest Reservation. It has just been completed and adds one more link to the very fine scenic drives in southern Colorado. It is reached from Pueblo by going south 28 miles to Beulah, continuing a 10 mile drive through varied scenery, joins what is known as the Wetmore road. This altogether makes about an easy one-day circle drive from Pueblo. The new roadway is 18 feet wide and constructed along lines giving perfect drainage which will make it possible to keep the road in good shape the year 'round. For the convenience of tourists the San Isabel Good Roads Association is building ovens along the entire route and this will undoubtedly make the trip very attractive to visitors to that part of the country.

On Oct. 12th there was held a big Barbecue below Rustic, Colo., in celebration of the completion of the Poudre Canon road as far as Rustic. This road was very much needed in the Fort Collins, Colo., district, and therefore the celebration of this opening was attended by many and with much enthusiasm. The road was built almost entirely with convict labor from the Colorado State Penitentary. Many of the convicts have been on the road gauge for several years and are very efficient. The usual plan is to turn the convicts, who of course are all trusties, over to the County and State Officials and to use them as laborers and operators of the various equipment in their construction work.

Denver is to have another addition to its mountain park system—Echo Lake—a real beauty spot will be reached by the construction of a Highway from the Mt-Evans road, a distance of about 12 miles. This road of course will be constructed by the City of Denver as it will be used only by those wishing to reach the Echo Lake property. This short stretch of road will open up one of the most beautiful sections of Colorado and will go a long ways toward completing the system of mountain parks, that might be called huge playgrounds for the general public which includes tourists from every part of the United States.

The Union Pacific R. R. Co., has petitioned the Interstate Commerce Commission for a permit to construct a 29 mile branch line to develop the North Platte Irrigation project now under construction by the U. S. Reclamation Service. This line will extend through Scottsbluff County, Nebr., and Goshen County, Wyo., and will be a feeder for one of the richest agricultural sections to be found anywhere in the Mountain States, and a section that is growing as fast as any in this district.

The State of Colorado is endeavoring to secure from the Santa Fe R. R. a strip of right of way covering a distance of 84 miles between Fowler and Manzanola, Colo. If the request is granted a concrete road will be constructed. It is not expected that the Railroad will grant this permission because it is understood that the right of way is being retained for additional trackage which undoubtedly will be needed in the near future.

The road between Denver and Boulder which traverses Jefferson, Adams and Boulder counties, is perhaps in worse condition than any other road in the State. It seems that the counties have not been in position to maintain this road properly, therefore the State Highway Commission has taken over the work and has put a large force of men and equipment to work.

Odell Bros. have about finished their season's campaign by the completion of two miles of the Maxwell Drainage Canal for the SunLand Co., near Raton, New Mexico. There are three miles more of canal to be excavated but it is not expected that this will be done this season.

A very pleasant visitor to this office was D. H. Christensen of the Christensen Construction Co., Salt Lake City, Utah. His description of double tracking work for the Union Pacific near Evanston, Wyo., was very interesting. He is using two Bucyrus 70-C shovels and a converted 70C dragline and a Class 14 Bucyrus dragline. In straightening out the track a heavy fill was made, the dragline being used for the first 20 feet of the fill, borrowing material alongside and dumping directly into the fill. In handling the material the bucket was raised perhaps 10 feet above the fill so as to pack the earth as much as possible. On top of this fill is being constructed a trestle and the balance of the material taken from a cut with this Class 14.

With the 70C Bucyrus they are averaging between 400 and 500 four yard dump cars per nine hour day, using two trains—one 14 car train and one 15 car train. For continuous service this is a very good average considering the controlling conditions on the job.

C. R. Conover and his brother dropped in a short time back and said, "We are going back into the con-

tracting game, and have signed up with the Industrial Sugar Co., for the excavation of coal pits, beet pits and other grading around their new plant at LaSalle, Colo." This is their first job for a good many moons as they have been growing wheat for the last several years and incidentally salted down some real money. They used their many teams on the farm work and thus kept them from being entirely idle owing to the lack of the right kind of construction work. We are mighty glad to know they are going back into the game because the contracting game will be benefited by contact with such men. Doc and his brother are old timers in this section in the Railroad and Irrigation field and they were missed a great deal during the period they sojourned on their farm near Platteville, Colo.

John Rice of Watt Bros. & Rice, Buffalo, Wyo., visited Denver a short time ago. He was returning home from a trip to the southern contracting fields where he went in quest of work that would keep their 14-B Bucyrus shovel busy during the winter months. They recently took 60,000 yards of State Highway work on the Buffalo-Sheridan, Wyo., State Highway. It is expected that this work will be completed in good time as they have a steam shovel engineer, Mr. Lovejoy—who is some humdinger when it comes to throwing dirt and to keeping his shovel in tip-top operation. Lovejoy visited this office the beginning of October on his way to Buffalo to start up the shovel. We knew right away that it meant "something doing."

Watt Bros. & Rice have completed their 15 mile strip of the Buffalo-Tensleep road for the U. S. Bureau of Public Roads. All that remains is finishing up this road and surfacing same which is principally road grader work. Some of the excavation which they encountered is perhaps the heaviest that has ever been done by as small a shovel as a 14-B Bucyrus,—exceedingly heavy rock, cemented gravel and shale. It is a piece of work that any owner of a little shovel would be proud to talk about and the above owners are no exception. They got through with this work in splendid time, even under the most adverse conditions and cleaned up strong, which is of course the main thing in contracting.

State Highway Dept., Denver, Colo. plans to build 6 mi. sand and clay highway, between Brush and Akron, Yuma Co. About $48,000. J. C. Maloney, state highway engr.

The city of Colorado Springs, Colo. receives bids about Dec. for paving 8 mi. Colorado, Cascade, Platte and Nevada Aves., involving 62,030 lin. ft. concrete curb and gutter, 84,254 cu. yd. earth excav., etc. About $1,148,598.

State Highway Dept., Denver, Colo. let contract grading, draining and surfacing 6½ mi. Moffat Highway, between Craig and Mabelle, 16 ft. wide, gravel, Moffat Co., to Northwestern Constr. Co., Craig, $67,736. Noted Sept. 16.

Project statement No. 116 Denver, Colo. was approved by state highway commission, and $110,000 will be expended for the improvement of road from Breed, 14 miles north of Colorado Springs to the city limits. E. E. Nichols, Chairman of State Highway Commission, Manitou.

Connecticut

Walter R. Corell is operating a type 75 Marion shovel for the Bathrop & Shea Co. at Cedar Hill Yard, Martowese.

Florida

A report from Fort Myers, says that the Atlantic Coast Line has resumed construction of its extension from Moore Haven to Immokalee, which was begun several years ago, but which was temporarily stopped on account of the war. It is to be completed to Immokalee by next spring. The completion of this extension, the report goes on to say, will give transportation facilities to part of Lee county that is now isolated, and will open up a rich farming region.

Voters in Escanaba county authorized the issue of bonds amounting to $2,000,000 for construction of 102 miles of permanently paved roads.

Idaho

H. H. Griffin is cranesman for the Western Construction Co. on a Marion type 60 shovel.

The Bureau of Highways has awarded a contract for the construction of 5.2 miles of the Gooding-Rupert highway, in Gooding County, to be graded and gravel surfaced, to Robert Paysee of Burley, at $48,849.50.

Good roads enthusiasts from all sections of Idaho are working hard in the campaign to secure the adoption of the constitutional amendment providing for $2,000,000 for the construction of roads, which will be voted on at the Presidential election.

Idaho residents are familiar with the value of highways and the success of the measure is a foregone conclusion.

Kansas

S. L. Phelps is operating a type 150 Bucyrus shovel for the Sheredon Coal Co. of Mulberry.

Maryland

The Maryland State Roads Commission has notified the County Commissioners of Montgomery County that it has decided to improve the following roads in the county as soon as preliminaries can be complied with: 3 mi. of the Silgo-Colesville Road; 2.8 mi. of the Gaithersburg-Muncaster Road; 3.5 mi. of the Rockville-Hunting Hill Road; 4 mi. of the Beallsville- Dickerson Road.

Massachusetts

State Highway Comm., at Boston, let contract paving state highway, Kingston, to Lane Constr. Corp., 37 Colony St., Meriden, $60,181.

City of Boston let contract building Caroline Ave., involving 350 cu. yd. concrete walls and 8,000 cu. yd. excav., to J. C. Coleman & Sons Co., 1620 Tremont St., Roxbury. About $25,000.

Mississippi

Geo. L. Stanford is operating a 70-ton Bucyrus shovel for the Lynch McNamara Co. of Crystal Springs.

Belzoni Drainage Comns., S. Castleman, Prest.; redredge 112 mi. ditches.

Missouri

State Highway Dept., Kennett, let contract building 8.62 mi. Dexter-Malden-Kennett Rd., 24 ft. wide, Federal Aid Project 26, Dunklin Co., to J. E. Crane, Murphreesboro, Ill., $107,283.

Locust D. D. having surveys made by Jacoby Eng. Co. engrs., 528 Shukert Bldg., Kansas City, for draining 3,000 acres in Linn and Sullivan Counties.

Brashear D. D., Adair Co., having surveys made for draining 3,500 acres of land. C. E. Jacoby Eng. Co., 528 Shukert Bldg., Kansas City, are engineering the job.

State Highway Dept., Jefferson City, plans to build 15 mi. Cairo-Poplar Bluff Rd., Federal Aid Project 118, Stoddard Co., involving 45,000 cu. yd. earth excav., 140,800 sq. yd. gravel surfacing, one 36 ft. span bridge, etc., cost $127,000; 49 mi. Crane-Galena-Reeds Springs-Blue Eye Rd., Federal Aid Project 161, Stone Co., 220,460 cu. yd. earth and 2,000 cu. yd. rock excav., 3,037 cu. yd. dry rubble masonery, etc., $137,885.

Montana

Walter Eaton is operating a 75-ton Marion shovel for the St. L. S. F. R. R. at Aurora.

City Council of Roundup, voted to issue $56,000 bonds to pave various streets, lay water mains and build ornamental lighting system.

Rosebud Co. let contract for grading and graveling 10 mi. of Federal Aid Project 114, 24 ft. wide, to Schleuter Bros., of Cartersville. About $64,000.

The State Highway Commission has awarded the following contracts:

Fallon County, Federal Aid Project No. 48, consisting of 25 miles to be graded and gravel surfaced, to B. P. Melchert of Lewistown, at $72,076.

Fallon County, Federal Aid Project No. 85, consisting of 17 miles to be graded and gravel surfaced, to J. E. Hilton at $110,646.

Nebraska

Plans are under way by the Union Pacific R. R. for the extension of line. Improvements includes the double tracking of road and approximately 29 miles of new road bed will be required on the cut-off.

Nevada

Andy Karl is acting as master mechanic of steam shovels for the Nevada Consolidated Copper Co. at Ruth.

New Jersey

Mr. George Felmey, Route A, Millville, is operating a Bucyrus shovel in this city. This machine is working alongside of two Thew shovels.

New York State

Mr. J. E. Blair, one of the pioneer dragline operators of this country was in New York City recently. For the past two or three years Mr. Blair has been in the East and has been in the employ of Pat McGovern, at Jersey City, and also in the employ of the New York, New Haven & Hartford Railroad, where he had charge of the repairs on their several railroad type shovels. Mr. Blair has recently come off a job at Fall River, Mass. with the Unit Construction Company of St. Louis, later doing work for the New England Oil Company. Mr. Blair is like many others in this line of work, somewhat of a wanderer, and has been in the employ of various concerns from the Atlantic to the Pacific. At one time he tried the Pacific coast and was employed by the Natomas Consolidated on the first Bucyrus draglines they purchased. Mr. Blair is looking for a good position in or near Chicago, as he is anxious to get back to the Middle West.

North Dakota

Comrs. Ward Co. plan to build 18 mi. State and Federal Highway between Burlington and Carpio. Cost between $90,000 and $125,000.

Northern States News

Several ditching propositions, known as the Bryant, Barrett and Tetzlaff Ditches, will be open for sealed bids on October 20th at Hayti, Hamlin County, South Dakota. The length of the respective ditches are five, fifteen and four miles.

The construction of the proposed new crossing of the stretch of road on the St. Paul-Duluth Highway, between the Kohler Road and Goose Lake has finally been agreed upon by the County Board and the Northern Pacific Railroad. The cost of this project will be approximately twenty thousand Dollars.

Over one hundred and twenty-five miles of highway has been graded and put into good condition this year by Minnehaha County of South Dakota, in which is the city of Sioux Falls. The W. R. Shipman Construction Company took a prominent part in this work of which the County is justly proud.

The City of Pipestone, Minnesota, has awarded contract to Campbell Construction Company, Minneapolis, Minnesota, for the construction of twelve blocks of paving.

William C. Fraser, St. Paul, Minnesota, was the successful bidder on the work recently let at Rochester, Minnesota, for the grading of 6th S.E. from 3rd Ave. S.E. to 11th Ave. S.E. at ninety cents per cu. yard.

The construction of the road between Cass Lake and the Ball Club, which is a stretch of road eleven miles long, has been let to Latvalla, Lake & Lidberg of Nashwauk, Minnesota.

The State Highway Commission of Montana are planning to do as much preliminary road work as the weather will permit during the winter, thus keeping as many men as possible employed in the state during the entire year.

Lac qui Parle Co. let contract for labor for building Co. Ditch 53, which involves 50,000 ft. 6-28 in. tile, to J. O. Volden, Madison, $11,000; furnishing tile, to Watertown Tile & Constr. Co., Watertown, S. D., $15,723.

Otter Tail Co. let contract graveling 9 mi. Federal Aid Project 159, 24 ft. wide, to M. J. Nolan, 2716 Bloomington Ave., Minneapolis. About $25,000.

Le Sueur Co. let contract for building 5 mi. Federal Aid Project 199, between Le Sueur, and Cleveland, involving culverts, tiling and 45,000 cu. yd. excav., to Nolan Bros., 18 North 2nd St., Minneapolis. About $46,000.

The Sargent mine, at Keewatin, owned by the Wisconsin Steel Co., which is being stripped by Winston Bros. Co., will soon be in shape to mill down from the present stripping limits.

To date 1,050,000 cubic yards have been removed. The contract calls for 1,250,000, which yardage should be totally removed by Jan. 1.

During an eight month period last year 600,000 yards were removed. Ore is now exposed in a number of places in the new pit. The Wisconsin Steel Co. plan to load no ore direct into cars for open pit mining, but will mill the product down into the mine for hoisting.

The Sargent overburden runs from 55 to 88 feet thick. The stripping contractors are using dinkey locomotives, and 4-yard dump cars. Out going track from the pit is on a 3% grade.

The Great Northern R. R. Co. has awarded a contract to the Baumgartner and McNemney Company of St. Paul, for the construction of a spur track to serve the Boeing mine, near Hibbing.

Ohio

Mr. E. F. Bywaters, an old timer in the shovel game who has had 17 years experience running various makes of shovels, is at present running a machine for the Wayne Coal Co. at Bloomingdale. This Company has three Bucyrus 225-B shovels doing their stripping and three 35-B Bucyrus shovels loading. Mr. Bywaters had a busy time during the war. He went overseas with the Fifth Regiment of the Marines and saw a lot of hard fighting, but was lucky enough to come through without a scratch. He was discharged about a year ago and has been with the Wayne Coal Co. ever since. Mr. Bywater's address is P. O. Box 111, Bloomingdale.

H. H. Hunter is operating a type 300 Marion shovel, shipping coal for the Wayne Coal Co. at Mingo Junction.

C. C. Clymer, was awarded contract for improvement of the Harris Road in Union Twp., at $17,096. S. E. Snyder, was awarded contract for improvement of the Ault Road in Cass Twp. at $10,293.

The Bertram Coal Mining Co. at Zanesville are operating a 225-B Bucyrus revolving shovel, and also a 35-B Bucyrus on their coal stripping job. The 225-B is doing most of the stripping. Some of the stripping is also done with the 35-B. The Bertram Coal Mining Co. report that they are loading about 50 tons per 8 hour day with their 35-B shovel.

Notes from the Pacific Coast

BY L. T. RUSSELL AND C. W. WHITNEY

The Kern County Board of Supervisors has let contract for connecting up the Maricopa, Fellows and Taft highways, at Taft, to Rogers Brothers for $128,900.00.

E. Schelling, Venice, was low bidder on improvements on the South Mountain Road near Santa Paula, Ventura County, approximating in amount $71,000.00. Mr. Schelling has been very busy of late and is very anxious to start his new 30-B Bucyrus shovel which was recently shipped to him.

J. R. Thornton has been appointed County Surveyor of Kern Co. to succeed A. E. Stegeman.

Bates & Borland have completed their Sonoma County highway work at Forestville and moved their 18-B Bucyrus to Santa Cruz County where they have some county highway contract. Jim Monyhan is still in charge and says he enjoys these summer resort jobs.

C. Miles of Sacramento has been awarded a contract for a section of the Tucson-Ajo, Highway, thirteen miles in length.

California Construction Company of Fresno and San Francisco, has been awarded a contract for two sections of the Fresno County highway system, totaling 30 miles, the total price being about $900,000.00.

Willett & Burr of San Francisco were low bidders for the construction of the Klamath River road, 8.7 miles long, located in the Klamath National Forest, Siskiyou Co. The bids have been referred to the Bureau of Public Works, United States Bureau of Agriculture.

Oregon

The Brownlee Lumber Co., of Medford, will build from eight to ten miles of track branching from the Pacific & Eastern to tap this vast timber acreage.

The State Highway Commission has awarded the following contracts.

Kamela-Hilgard section, Old Oregon Trail, grading, to Warren Construction Company, at $186,258.70.

Lawen-Crane section, Central Oregon Highway, grading and surfacing, to Porter & Conley, Portland, at $147,365.

Pittsburgh and Vicinity

BY F. A. RUMBARGER

Horace C. Turnham, Shovel Engineer is running for the McMinamin Construction Company at Brownsville, Pa. a Marion 20. Mr. Turnham was at one time an outside erector and engineer for the Bucyrus Company, having done considerable shovel erecting both in this Country and Abroad.

O. G. Beans, General Manager of the Beluan Coal Company, Wheeling, W. Va. reports their operation is making very satisfactory tonnage in face of the present car shortage.

John Beck, Chicago Representative of the Western Wheeled Scraper Company was a business caller in Pittsburgh recently.

The Kehota Coal Mining Company, Pittsburgh, have recently purchased additional Marion shovels which will be used on a new operation near Adena, Ohio.

Ferguson & Edmondson, Contractors, Pittsburgh have a grading job on the Montour Railroad of Approximately 75,000 yards of excavating on which they are using two Marion 60 shovels.

James Leonard and Ham Largent are running the Bucyrus 225-B shovel for the Federal Gas Coal Company. A. J. Cass is Master Mechanic of this Company.

Edward Smith is running the Cadiz Block Coal Company's 225-B at Cadiz, Ohio and A. M. Wagner their Marion 36.

The Randall Coal Company, Morgantown, W. Va., are using a Marion 28 mounted on caterpillars for excavating for a new coal tipple at Randall, W. Va. James Rush is General Manager and James Eldridge is Superintendent.

Cole Brothers, Morgentown, W. Va. are using an Erie B on their road work at Morgantown. John Maugendollae is General Superintendent.

Bill Blanchard, General Manager of the Blanchard Coal Company spends an occasional day in the city and advises us that their operation is running along very nicely and that during the month of October they had pretty good run of coal. Mr. Peter Ranier is Superintendent.

W. H. Parker is operating a Bucyrus 14-B for the Reilly, Callahan Coal & Coke Company at Connelsville, Pa.

South Dakota

The Bucyrus Type 45C steam shovel with 1¾ yd. dipper recently installed in the quarry of Wisconsin Granite Co., Sioux Falls, dumps into 2 yd. cars which are drawn by horses. Eventually, however, cars of larger size will be installed, with locomotive.

Southern States Notes

BY C. N. BALLENTINE AND E. J. WILKIE, BIRMINGHAM, ALA.

Mr. Charles Blanchard is in charge of the operations of the Monro-Warrior Coal & Coke Company, near Nauvoo, Alabama.

Mr. J. D. Morris, steam shovel engineer, is available for work on railroad or revolving shovels. His address is 322 Charles Street, Birmingham, Alabama.

Mr. Marion Bigham, who has been operating a shovel in Arkansas, is now in this vicinity and on the lookout for new work. He can be reached at Dora, Alabama.

Mr. M. H. Edmondson is in charge of the operation of a ¾-yard P. & H. dragline near Cooper, Texas.

The Fourth District, Mississippi River Commission, with office at New Orleans, has several million yards of levee work to let to contractors.

The Appalachian Logging Congress will hold its annual Fall meeting at Knoxville, Tennessee, November 11, 12 and 13th. The headquarters will be at the Farragut Hotel.

W. T. Taylor Construction Company were low bidders for Project No. 80, in Alabama.

Houston Harbor Board, Houston, Texas, is considering additional improvements on the ship channel and contemplates the extension of the channel frontage.

Mr. L. C. Rawlinson, of Montgomery, Alabama, was low bidder for Project No. 51, Russell County, Alabama.

A. R. Holmes is operating a type 29 Osgood at Wilson Dam, Alabama. His address is Box 1161.

The Ransom-Benedict Company are constructing a standard gauge logging railroad on their property at Clifty, Tennessee. This railroad follows the bed of the Big Laurel Creek, and will be used to handle the lumber and logs available on their property. Mr. Walter Fleenen is superintendent of the construction of this railroad.

The Dixie Portland Cement Company, at Richard City, Tennessee, are making some improvements in their power plant at that place. Mr. W. H. Kline is superintendent for this company.

Mr. S. A. Lacy, of Anniston, Alabama, has about completed his work for the L. & N. Railroad at Orange Grove, Mississippi, and is on the lookout for more work for his dragline excavator.

Mr. C. R. Nichols, of Wichita Falls, Texas, has a contract with the city for the construction of a large sewer. A great deal of this work will require the digging of trenches 6′ x 20′ deep, and he has recently purchased a Bucyrus Trench Excavator to handle the excavation.

The Floyd County Commissioners, of Rome, Georgia, have $65,000.00 available for the construction of seven

miles of soil surfaced roadway. J. W. Stapp Construction Company, of Louisville, Alabama, are the contractors.

The Lincoln County Commissioners, at Star City, Arkansas, will expend $325,000.00 for the construction of thirteen miles of gravel road in the Grady-Arkansas River Road District. The General Construction Company, of Little Rock, Arkansas, are the contractors.

Mr. L. C. Gillen is operating a shovel for Galley & Myers, at Chattanooga, Tennessee. This shovel is loading rock from a quarry at the base of Lookout Mountain, the rock being used for construction work and for fluxing in the manufacture of steel.

Knox County, Tennessee, voted $400,000 state and federal aid in building Kingston Pike, from the city limits to the Knox-Loudon county line. The project will cost a total of $600,000. Dan L. Little, County Road Supt.

Fentress Co. in Tennessee, voted $200,000 bonds to build two highways, one running from Pickett Co. line near Boatland to Morgan Co. line near Brewster Fork, crossing Dixie Short Route at Jamestown, and others starting at Overton Co. line at a point near Davidson and running to Morgan Co. line east of Banner Springs, crossing Dixie Short Route National Highway, at Grimsley.

Texas

Montague Co. will grade, surface and build bridges and culverts on 3.92 mi. Highway 2D, Federal Aid Project 128C involving 3.6 acres clearing, 23,702 cu. yd. borrow and 99 cu. yd. loose rock excav., 3,160 cu. yd. gravel, 4,999 cu. yd. clay surfacing, 12,825 lb. reinforcing and 35.744 lb. structural steel, 69.9 cu. yd. Class "A," 32.6 cu. yd. Class "B" and 33.7 cu. yd. Class "C" concrete, etc. About $50,148; including 10 per cent for engineering and contingencies. Work will be done by day labor under supervision of W. T. Russell, co. judge.

Morris Co. having prepared surfacing and building bridges and culverts on 10.68 mi. Highway 1A from Cass to Titus Co. lines, involving 6 acres clearing and grubbing 40,356 cu. yd. earth excav., 16,528 cu. yd. gravel, 29,788 lb. reinforcing steel, 99,420 ft. timber, 406.6 cu. yd. Class "A," 76 cu. yd. Class "B" and 21 cu. yd. Class "C" concrete. About $111,148. McClendon & Pumell, Daingerfield, co. engrs.

Robertson Co. received bids Sept. 16 improving 17.99 mi. Highway 14 from Nesbit to point 2 mi. north of Wheelock, 15 ft. wide, involving (a) 114.9 acres clearing and grubbing, grading road, 83,797 cu. yd. borrow and surfacing road with gravel, (b) building rein.-con. and steel span bridges and concrete culverts, from Haden & Austin, 727 Kress Bldg., Houston, a(a) $116,419; Harris & Powell, Tyler (a and b) $184,669; Cook & Arrington, Crockett, (a and b) $186,078.

Bibb and Hughes, Box 193, Hillsboro, will sublet contract for grading road in Hill County, 75 miles.

Jasper Co. received bids Sept. 13, grading and draining 12.48 mi. Highway 8 from Buna southeast to Newton Co. line, 24 ft. wide, from H. F. Bland, San Augustine, $62,213; J. A. Shaw, Jasper, $64,673.

Nacogdoches Co. let contract improving 45 mi. various roads, 24 ft. wide, to Smith Bros., Crockett, $191,000. Work involves 280 acres clearing and grubbing, 200,000 cu. yd. overhaul, 350,000 cu. yd. borrow, 45,000 cu. yd. loose and 5,000 cu. yd. solid rock excav.

Utah

P. J. Moran has his 18-B shovel working on a job at Salt Lake City, putting in a new water system. He is laying out from 275 to 300 ft. of pipe per day per 8 hours. The total cost will be $385,000. Mr. Moran finds his 18-B very adaptable for this job. It is used for digging ditches and as a special crane in laying the water pipes. Much of the work is in solid rock. All engineering and supervision is being handled under the direction of S. Q. Cannon, City Engineer.

Washington

The Wenatchee Southern R. R. Co. has been organized to build a railroad from Wenatchee south along Columbia River to Pasco, connecting four main east and west railroads.

West Virginia

D. W. Cohick is operating a type 28 Marion shovel for the Wierton Steel Co. at Wierton.

Milt DeSavigny is working on a job near Richwood at present. Two Marions a 28 on caterpillars and a 31 on railroad trucks, are doing the dirt moving. The work is building railroad into 100,000 acres of Virgin Timber, that has never been cut. Milt reports that game is very plentiful and the woods are full of bear, deer and turkeys. The land is owned by the Cherry River Boom & Lumber Co.

Greenbrier Co. voted $94,000 bonds to improve roads in Blue Sulphur Dist.

Wisconsin

Waukesha Co. let contract to Universal Eng Co, Eau Claire, grading and constructing bridge on Oconomowoc Relocation, involving 20,000 cu. yd. grading, $0.89; 2.1 acres clearing and grubbing, $150 per acre, etc.

Foreign

South America

The ministry of public works of Uruguay is calling for bids for the construction of a railroad line to connect Rocha, in the southeastern part of the republic, with the nearest point of the governent line, which was formerly controlled by the Uruguayan East Coast Railway Co.

A railway is to be constructed in Nicaragua from Chinandega to Playa Grande, Peninsula of Cosiguina, in the Gulf of Fonseca (about 31 miles), and a branch line from it, near El Tempisque, to the Honduras frontier in the department of Choluteca (about 20 miles).

Bids are wanted for the construction of a railway from Iquique to Pintado, Chile. The railroad from Confluencia to Tome has just been completed.

Forty million pesos will be spent by an Argentine railway for extensions, rolling stock, improvements at the stations in Retiro, Cordoba and Rosario, approach to the port and electrification of the line from Buenos Aires to San Martin.

Supplies will be needed, to cost about three and one-half million dollars, for the construction of a branch railway from Bahia Blanca to Patagones.

"What is it that comes in jugs, is yellow and has raisins in it?"

"I give up."

"Cider."

"But where do the raisins come in?"

"Oh, I put those in to make it hard." —*Record*

A Much-Needed Machine.—A slot-machine has been invented which, on the deposit of a small coin, will tell a passenger what speed the train is traveling. What would be more interesting is a machine which would tell the passenger what the brakeman said when he announced the next station. —*Kansas City Star.*

PROSPECTIVE · CONSTRUCTION

Arizona

Pima Co. plans to build following roads: Casa Grande, cost $255,000; Borderland, $182,000; Vail-Benson, $174,339; Nogales, $317,747; Ajo-Gunsight, $124,241; Ajo East, $680,000; Ajo West, $330,000; Mt. Lemon, $49,000; Twin Buttes, $90,424; Indian School, $2,300; North Tanque Verde, $39,324; South Tanque Verde, $22,500; Fort Lowell, $14,962; Sasabe, $315,723; Arivaca, $168,000; Kennison Dip, $7,700; Cienego Dip, $4,666; 6th Ave., $29,412; Pantano Bridge, $30,000. Total cost, $2,837,338. About $1,861,383 available.

California

Engineer Lindsay of the Western Pacific will make a survey for the construction of a section of road extending from Bidwell to Bidwell Bar, approximately 2½ miles.

Colorado

It is proposed to construct 4½ miles of graded road from Lisle and F Sts., Salida, Colo., to the Fremount County Line. Plans and specifications submitted by the State Highway Commission to the United States Bureau of Public Roads for Federal aid.

Idaho

State Highway Dept., Boise, plans to grade and drain 21.8 mi. Sawtooth Park Highway-Salmon North Fork Sect. Lemhi Co., cost $347,000; 7.88 mi. Lost River Highway connecting Federal Aid Projects 3 and 4, Custer Co., $85,000; 12.4 mi. Lost River Highway from Mackay to Darlington, Custer Co., $141,000. W. J. Hall, Boise, comr. Pub. Wks.

Kansas

Sedgwick Co. had plans prepared grading and surfacing 5.59 mi. Project 54, Sect. A. Cannon Ball Rd., 18 ft. wide, concrete or brick. M. Roseberry, Wichita, engr.

Missouri

Road Commissioners of the eight-mile district have agreed to raise sufficient money for the east and west road through Greene County. State and Federal aid of $8,000 a mile will be available for said work.

Dade Co. had plans prepared grading, building culverts and bridges on 5.06 mi. road in Lockwood Twp., 12 ft. gravel, 24 ft. roadway, waterbound macadam. About $34,350. Elston, Axon & Russell, 309 McDaniel Bldg., Springfield, engrs.

Bids will be received until Nov. 5, by Secretary, Mississippi River Comn., 1311 International Life Bldg., building 1,100,000 cu. yd. earth work in Sny Island Levee D. D.

Office of the Secretary, Mississippi River Commission, 1311 International Life Building, St. Louis, will receive sealed proposals until 11 a. m., Nov. 18, 1920, for constructing about 216,000 cubic yards of earthwork in the Kings Lake Drainage District. Further information on application.

Montana

State Highway Dept., Helena, plans to gravel surface, 5 mi. Saco Sect. of Roosevelt Highway, Phillips Co., cost $26,675; 2.2 mi. Deer Lodge-Drummond Rd., Powell Co., $48,506; 30 mi. Choteau-Dupuyer Rd., Teton Co., $194,656. Federal Government has been asked to appropriate toward cost. J. N. Edy, state highway engr.

State Highway Dept., Helena, plans to gravel surface 18 mi. Glasgow-Nashua Rd., Valley Co., cost $118,855; 6 mi. Glasgow-Jordan Rd., Valley Co., $41,085; pave 0.373 mi. McLeod Ave., 18 ft. wide, Sweet Grass Co., $20,228. Federal Government has been asked to appropriate toward cost. J. N. Edy, state highway engr.

Nevada

Commissioners of Washoe County have authorized the survey of the new section of highway to be constructed between Long Valley in northern Washoe County and Cedarville. Road will be three miles long. Commissioners also authorized the widening of Reno-Purdy Road.

Construction of 15 mi. of gravel road between Reno and Purdy, on the California-Nevada line has been planned by the Co. Comrs. of Washoe Co.; estimate $191,000.

New Mexico

Curry County will vote on a bond issue of $200,000 for the construction of a hard surfaced road to the northern part of Curry County, with $25,000 for improvements of the Texico Road and $25,000 for the Melrose Road.

New Hampshire

A new road will be built to replace the road at Richmond. The road will be 18 feet wide, 2,800 ft. long and constructed under the direction of C. C. Plimpton, a state construction foreman.

Texas

Val Verde Co. is having plans prepared grading, surfacing and draining 4.54 mi. Highway 4 from 4.9 mi. north of here to San Pedro Creek, involving 9,246 cu. yd. gravel, 72,460 sq. yd. rolling, 7,258 lb. reinforcing steel, 181 cu. yd. Class "A" concrete, 7,992 cu. yd. earth, 1,064 cu. yd. loose rock and 523 cu. yd. solid rock excav. About $35,100. G. M. Jowers is engr.

Washington and Waller Counties will construct a road which will form part of Houston-Austin Highway.

The City of Dallas, has ordered the following grading projects: South Lamar, $270,000; Washington Ave., $35,000; Jefferson Ave., $140,000; Forest Ave., $35,000; Munger Ave., $25,000; Nettie St., $22,000, and Austin St., $20,000.

Chambers Co. is having plans prepared surfacing and building bridges and culverts on 11.35 mi. Highway 35 from Anahuace to Liberty Co., involving 23.4 acres clearing and grubbing, 84,000 cu. yd. borrow and 200 cu. yd. structural excav., 400 cu. yd. Class "A" concrete, 37,000 lb. reinforcing steel and 27,000 cu. yd. shell surfacing. About $133,255. H. J. Walger, Orchard, engr.

Travis Co. is having plans prepared grading, gravel surfacing and draining 8.6 mi. Highway 20 from 2 mi. east of Manor to Bastrop Co., involving 22,300 cu. yd. gravel, 41,190 lb. reinforcing steel, 79,815 sq. yd. bituminous macadam, 66,800 cu. yd. unclassified earth and 700 cu. yd. structural ecav., 475 cu. yd. Class "A" and 183 cu. yd. Class "B" concrete. About $207,499. H. W. Nolan, 511 Scarbrough Bldg., engr.

Dallas Co. had plans prepared grading, surfacing and draining 18.08 mi. Garland Rd., Highway 1 from here to Rockwall Co. line, involving 58,425 cu. yd. borrow, 4,443 cu. yd. solid rock and 890 cu. yd. loose rock excav., 396,009 lb. reinforcing steel 118,546 lb. reinforcing mesh, 4,299.6 cu. yd. Class "A" and 496 cu. yd. Class "B" concrete, 3,449 cu. yd. bituminous concrete, etc. About $973,865. Nagle, Witt & Rollins Eng. Co., Gaston Bldg., engrs.

Inter-County Highway planned by three counties of Hopkins, Delta and Lamar, to be known as Inter-County State Aid Road No. 19A, 36 miles in length.

Cooke Co. having plans prepared grading, gravel surfacing and draining 9.5 mi. Highway 40 from Denton Co. line to north boundary line Rd. Dist. 1, involving 95,000 cu. yd. unclassified earth excav., 24,776 cu. yd. gravel, 64,000 lb. reinforing steel, and 800 cu. yd. Class "A" concrete. About $169,619. Bryant & Huffmann, 211-217 Littlefield Bldg., Austin, engrs.

San Patricio Co. opens bids about Oct. 20, grading, surfacing and draining 12.04 mi. Highway 9 through Rd. Dist. 5, also 15.5 mi. Highway 9 through Rd. Dist. 1 A. C. Pancoast, Beeville, co. engr. Noted Sept. 23.

Val Verde Co. having plans prepared grading, gravel surfacing and draining 7.29 mi. Highway 12 from 5 mi.

north of here to Devils River, involving 15,000 cu. yd. earth, 3,000 cu. yd. solid and 2,500 cu. yd. loose rock excav., 14,700 cu. yd. gravel, 14,500 lb. reinforcing steel, 125 cu. yd. Class "A," 24 cu. yd. Class "B" and 142 cu. yd. 1 : 2 : 3 concrete. About $50,760. G. M. Jowers, co. engr.

Washington

$154,053 will be raised for the construction of road and bridge work in Walla Walla County.

West Virginia

Comrs. Morgan Co. plan to grade Great Cacapon Rd. About $45,000. Federal Government will appropriate 50 per cent of cost. C. A. Rothbrock, Berkeley Springs, engr.

Comrs. Tyler Co. plan to grade 4 mi. River Rd. About $47,000. Federal Government will appropriate 50 per cent of cost. C. B. Cook, Middlebourne, engr.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the price named.

WILLIAMS HERCULES EXCAVATOR BUCKET—An illustrated pamphlet, 8¼ x 10¾, describing in detail the Williams Hercules Excavating Buckets. Illustration of bucket and blue drawing, showing dimensions, also table of sizes, weights and dimensions. *The G. H. Williams Co., Erie, Pa.*

ACME, THE TRUCK OF PROVED UNITS—An illustrated catalog, 40 pages, 6½ x 10, describing the Acme motor truck, and steel dump bodies, which are of special interest to excavators and contractors. *Acme Motor Truck Co., Cadillac, Mich.*

G. M. C. HEAVY DUTY TRUCKS—An illustrated catalog, 7¾ x 10¾, describing the G. M. C. Heavy Duty Trucks, which are built in 2½ and 5-ton models. Also describing how these trucks are very adaptable for excavating work, *General Motors Truck Co., Pontiac, Mich.*

TRADE NOTES

Dwight P. Robinson & Company, Inc., (with which Westinghouse, Church, Kerr & Co., Inc., has recently consolidated), Engineers and Constructors of New York, has established a new branch office in Youngstown, Ohio, in the Home Savings & Loan Building, in charge of Mr. C. I. Crippen.

The Company recently moved its Cleveland office from the Leader News Building to the Citizens Building, and Mr. H. P. Clawson, who was for several years a member of the Chicago staff, has been transferred to Cleveland to take charge of this office.

The Company now maintains branch offices in Pittsburgh, Youngstown, Cleveland, Chicago, Dallas and Los Angeles, and Sao Paulo, Brazil.

Railroads Sawing Wood While the Talkers Talk

(Continued from page 302)

"Ordinarily in this country about 15% of all locomotives are on the sicklist. If by better terminals and shops this figure could be cut to 10%, 3,500 more engines would be available—the equivalent of the purchase of as many new locomotives.

"The Advisory Committee of the Association of Railway Executives, of which Mr. Daniel Willard is Chairman, has set for its goal in the improvement of transportation service the following definite ends:

1. An average daily minimum movement of freight cars of not less than 30 miles per day;
2. An average loading of 30 tons per car;
3. Reduction of bad order cars to a maximum of 4% of total owned;
4. An early and substantial reduction in the number of locomotives now unfit for service;
5. More effective efforts to bring about the return of cars to the owner roads.

"The fourth item is the all-important one. Modern locomotive terminals and repair shops alone can reduce the number of bad order engines.

"In spite of insufficient facilities for the proper care of their motive power the railroads have been able to make considerable progress. With modern roundhouses, coaling stations, shops, they could deliver the kind of transportation that would quickly re-establish them as going, money-making concerns worthy of the old-time confidence and support of the American public."

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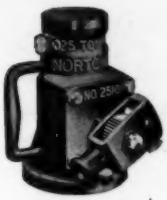

For convenience in making inquiry use postal inserted in this number

A view of the canal looking South from Station 445 (station numbers on map on opposite page). One of the 225-B Bucyrus Electric Revolving shovels in close quarters in a rock cut. Note how the cut is channelled at the top and close-drilled the rest of the way. Electric locomotive and Western dump cars can be seen in the background. Notice the trolley wire offset 7 feet from the track center, to allow the shovel dipper to swing over the dump cars.

Easier digging in an earth section of the canal. Another Bucyrus 225-B in action. The rock at the sides of the cut is rip-rap dumped in to hold the banks against slides.

Two Photographs Showing the Different Kinds of Excavation Necessary in Digging the Queenston-Chippewa Power Canal